

PRELIMINARY CHARACTERIZATION OF REAL TIME PM MASS AND COMPOSITION PROFILE IN SMOKES FROM DIFFERENT SOURCES: CIGARETTE, INCENSE STICKS, POTATO FRYING AND URBAN POLLUTION

Giovanni Invernizzi, Tobacco Control Unit, Istituto Nazionale dei Tumori /SIMG-ISDE Milan, Italy.

Cinzia De Marco, Tobacco Control Unit, Istituto Nazionale dei Tumori / Milan, Italy.

Roberto Mazza, Tobacco Control Unit, Istituto Nazionale dei Tumori /Milan, Italy.

Roberto Boffi, Tobacco Control Unit, Istituto Nazionale dei Tumori /Milan, Italy.

Constantinos Sioutas, University of Southern California, Pasadena, CA, USA

Dane Westerthal, Cornell University, Ithaca, NY, USA

Grisa Mocnik, Aerosol d.o.o., Ljubljana, Slovenia

Ario A. Ruprecht, Tobacco Control Unit, Istituto Nazionale dei Tumori /SIMG-ISDE Milan, Italy.

Background and Aims: airborne nicotine is the only specific marker of ETS, but real time analysis is not possible. Aim of study is to explore the existence of a specific mass and composition profile of ETS originated Particulate Matter (PM) whose measure could identify the presence and amount of ETS in real time with quick and reliable ETS monitoring.

Methods: Analyzers: Aerocet 531, (MetOne) to record mass of PM₁, PM_{2.5} PM₁₀ and Aethalometers AE51 (Magee) for Elemental Carbon (BC) and Organic Carbon (OC).

Procedure: Instruments operated in 40 m³ room with 0.3/0.6 ach and adequate mixing factor measuring urban pollution, cigarette smoke and incense stick burning. Background and cooking combustion pollution was measured in a kitchen of 35 m³ frying two portions of potatoes.

Results: Ratios of the means of peak concentrations of different pollutant in different types of smokes

	BC/OC-BC/PM1-BC/PM2.5-BC/PM1-OC/PM1-OC/PM2.5-OC/PM10-PM1/PM2.5-PM1/PM10-PM2.5/PM10									
Urb.bckg	0.35	0.24	0.21	0.15	0.69	0.61	0.43	0.88	0.63	0.71
Pot.frying	0.33	0.02	0.01	0.01	0.06	0.04	0.03	0.72	0.57	0.80
ETS	0.11	0.06	0.05	0.04	0.55	0.44	0.42	0.80	0.76	0.96
Inc. stick	0.04	0.01	0.01	0.01	0.15	0.14	0.14	0.91	0.91	1.00

BC/OC and BC/PM ratios were lower in ETS as compared to urban background, while OC/PM were similar. In contrast, OC/PM was remarkably higher in ETS vs potato frying and incense sticks. Ratios between PM of different size did not show relevant differences.

Conclusions: Differences in mass profile of different parameters are promising about possibility to identify a real time "fingerprint" of ETS presence in the environment. Further studies are necessary to confirm these preliminary results extending to other categories of indoor confounders, and to evaluate the suitability of this approach to ETS monitoring in public places.

References:

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